W03077-QES

Quanterra

Quanterra
2800 George Washington Way
Richland, Washington 99352-1613

509 375-3131 Telephone
509 375-5590 Fax

(0[illegible])

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

March 12, 2000

Attention: Joan Kessner

SAF Number	:	B00-024
Date SDG Closed	:	February 14, 2000
Number of Samples	:	One (1)
Sample Type	:	Other
SDG Number	:	W03077
Data Deliverable	:	15 Day / Summary

I. Introduction

On February 14, 2000, one air filter (matrix: other) sample was received at the Quanterra Richland Laboratory (QRL) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

QRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
9D8JF410	B0XKV2	OTHER	2/14/00

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Gas Proportional Counting
Gross Alpha by method RICH-RC-5014
Gross Beta by method RICH-RC-5014
Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017

III. Quality Control

The analytical results for each analysis performed under SDG W03077 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Gas Proportional Counting

Gross Alpha by method RICH-RC-5014:

The precipitate weight for samples B0XKV2 and B0XKV2 duplicate exceeded the calibration limit due to sample matrix. With client approval [R. Weiss 3/3/00], the sample results are estimated based on the calculation using the maximum weight limit (actual precipitate approximately 100 mg; calculation using 60 mg). Except as noted the LCS, batch blank, sample and sample duplicate (B0XKV2) results are within contractual requirements.

Gross Beta by method RICH-RC-5014:

The LCS, batch blank, sample and sample duplicate (B0XKV2) results are within contractual requirements.

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017:

The LCS, batch blank, sample and sample duplicate (B0XKV2) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Jackie Waddell
Project Manager

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03077 / 10019
LAB SAMPLE ID:	9D8JF410	MATRIX:	FILTER
CLIENT ID:	B0XKV2	DATE RECEIVED:	2/14/2000 1:55:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
CO-60	5.42E-01	U	2.2E+00	2.2E+00	4.14E+00	pCi/sa		RICHRC5017
CS-137	1.14E-01	U	1.8E+00	1.8E+00	3.26E+00	pCi/sa		RICHRC5017
EU-152	-1.62E+00	U	4.2E+00	4.2E+00	7.22E+00	pCi/sa		RICHRC5017
EU-154	3.33E+00	U	5.9E+00	5.9E+00	1.18E+01	pCi/sa		RICHRC5017
EU-155	-1.52E+00	U	3.9E+00	3.9E+00	6.85E+00	pCi/sa		RICHRC5017
ALPHA	2.79E+00		7.7E-01	1.0E+00	5.84E-01	pCi/sa	100.00%	RICHRC5014
BETA	9.84E+00		1.1E+00	1.8E+00	1.30E+00	pCi/sa	100.00%	RICHRC5014

Number of Results: 7

AIR QUALITY DOCUMENT

Quanterra

DUPLICATE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03077 / 10019
LAB SAMPLE ID:	D8JF414R	MATRIX:	FILTER
CLIENT ID:	B0XKV2	DATE RECEIVED:	2/14/2000 1:55:00 P
ORIG LAB SAMPLE ID:	9D8JF410		

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
ALPHA	3.61E+00		9.0E-01	1.2E+00	6.14E-01	pCi/sa	100.00%	RICHRC5014	2.79E+00	25.61%

Number of Results: 1

AIR QUALITY DOCUMENT

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra Analyticall Services, Inc

rptChemRadDup; v3.41

Quanterra

DUPLICATE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03077 / 10019
LAB SAMPLE ID:	D8JF415R	MATRIX:	FILTER
CLIENT ID:	B0XKV2	DATE RECEIVED:	2/14/2000 1:55:00 P
ORIG LAB SAMPLE ID:	9D8JF410		

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
BETA	8.81E+00		1.1E+00	1.7E+00	1.26E+00	pCi/sa	100.00%	RICHRC5014	9.84E+00	11.11%

Number of Results: 1

AIR QUALITY DOCUMENT

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra Analyticall Services, Inc

rptChemRadDup; v3.41

Quanterra

DUPLICATE RESULTS

LAB NAME:	QUANTERRA, Richland	**SDG: /RPT GRP:**	W03077 / 10019
LAB SAMPLE ID:	D8JF416R	**MATRIX:**	FILTER
CLIENT ID:	B0XKV2	**DATE RECEIVED:**	2/14/2000 1:55:00 P
ORIG LAB SAMPLE ID:	9D8JF410		

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
CO-60	8.68E-02	U	2.3E+00	2.3E+00	4.29E+00	pCi/sa		RICHRC5017	5.42E-01	144.76%
CS-137	5.61E-01	U	1.8E+00	1.8E+00	3.33E+00	pCi/sa		RICHRC5017	1.14E-01	132.29%
EU-152	2.06E+00	U	4.1E+00	4.1E+00	7.40E+00	pCi/sa		RICHRC5017	-1.62E+00	1673.20%
EU-154	-4.08E+00	U	5.5E+00	5.5E+00	9.05E+00	pCi/sa		RICHRC5017	3.33E+00	1985.30%
EU-155	1.82E-01	U	2.8E+00	2.8E+00	4.90E+00	pCi/sa		RICHRC5017	-1.52E+00	254.25%

Number of Results: 5

AIR QUALITY DOCUMENT

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra Analyticall Services, Inc

rptChemRadDup; v3.41

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W03077 / 10019

LAB SAMPLE ID: D8JR911B MATRIX: FILTER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	-5.89E-03	U	3.1E-02	3.1E-02	1.00E-01	pCi/sa	100.00%	RICHRC5014

Number of Results: 1

AIR QUALITY DOCUMENT

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

Quanterra Analytical Services, Inc

rptChemRadBlank; v3.41

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W03077 / 10019

LAB SAMPLE ID: D8JRK11B MATRIX: FILTER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
BETA	-8.23E-03	U	2.5E-01	2.5E-01	5.62E-01	pCi/sa	100.00%	RICHRC5014

Number of Results: 1

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W03077 / 10019

LAB SAMPLE ID: D8JRP11B MATRIX: FILTER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
CO-60	1.55E+00	U	2.2E+00	2.2E+00	4.41E+00	pCi/sa		RICHRC5017
CS-137	2.08E+00	U	2.0E+00	2.0E+00	3.99E+00	pCi/sa		RICHRC5017
EU-152	-1.32E+00	U	4.5E+00	4.5E+00	7.85E+00	pCi/sa		RICHRC5017
EU-154	1.52E+00	U	5.0E+00	5.0E+00	1.01E+01	pCi/sa		RICHRC5017
EU-155	-1.43E+00	U	4.1E+00	4.1E+00	7.17E+00	pCi/sa		RICHRC5017

Number of Results: 5

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03077 / 10019
LAB SAMPLE ID:	D8JR912S	MATRIX:	FILTER

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
ALPHA	4.48E+00		4.2E-01	1.1E+00	8.39E-02	pCi/sa	100.00%	4.55E+00	98.37%

Number of Results: 1

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03077 / 10019
LAB SAMPLE ID:	D8JRK12S	MATRIX:	FILTER

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
BETA	1.30E+01		7.7E-01	2.0E+00	5.32E-01	pCi/sa	100.00%	1.36E+01	95.42%

Number of Results: 1

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	QUANTERRA, Richland	**SDG: /RPT GRP:**	W03077 / 10019
LAB SAMPLE ID:	D8JRP12S	**MATRIX:**	FILTER

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
CO-60	8.35E+01		1.3E+01	1.3E+01	1.39E+01	pCi/sa		7.67E+01	108.91%
CS-137	5.02E+01		9.1E+00	9.1E+00	4.33E+00	pCi/sa		5.01E+01	100.22%
EU-152	1.41E+02		2.0E+01	2.0E+01	9.29E+00	pCi/sa		1.54E+02	91.79%

Number of Results: 3

Quanterra

Data Review Checklist
RADIOCHEMISTRY

Lot Number:	JOB14614.0
Client ID:	BHI
Due Date:	2-29-00
QC Batch Number:	0046189
SDG Number:	103077
Method Test Parameter:	gamma
Matrix:	filter

Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	✓
B. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓	
2. Were all sample holding times met?	✓			
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			
C. QC Samples 1. Is the blank yield within acceptance criteria?			✓	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			
3. Does the blank result meet the Contract criteria?	✓			
4. Is the blank result < the Contract Detection Limit?	✓			
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			
7. Is the LCS yield within acceptance criteria?			✓	
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			
D. Other 1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			
3. Was the correct methodology used?	✓			
4. Was transcription checked?	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Were units checked?	✓			

Comments on any "No" response: _____

AIR QUALITY DOCUMENT

First Level Review: Pam Kenitzer Date: 2-17-00

Second Level Review: Jackie Waddell Date: 3/11/00

Quanterra

Data Review Checklist
RADIOCHEMISTRY

Priority

Lot Number:	J0B140160
Client ID:	BHI
Due Date:	2-29-00
QC Batch Number:	0046185
SDG Number:	W03077
Method Test Parameter:	A
Matrix:	Filter

Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	✓
B. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓	
2. Were all sample holding times met?	✓			
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			
C. QC Samples 1. Is the blank yield within acceptance criteria?			✓	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			
3. Does the blank result meet the Contract criteria?	✓			
4. Is the blank result < the Contract Detection Limit?	✓			
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			
7. Is the LCS yield within acceptance criteria?			✓	
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			
D. Other 1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			
3. Was the correct methodology used?	✓			
4. Was transcription checked?	✓			
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Were units checked?	✓			

Comments on any "No" response: _____

AIR QUALITY DOCUMENT

First Level Review: Pam Kenitzer Date: 3-8-00

Second Level Review: Jackie Waddell Date: 3/11/00

0015

Quanterra

Data Review Checklist
RADIOCHEMISTRY

Sequential

Priority

Lot Number: J0B140160
Client ID: BHI
Due Date: 2-29-00
QC Batch Number: 0046188 SDG Number: 3077
Method Test Parameter: Beta
Matrix: Filter

Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	✓
B. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓	
2. Were all sample holding times met?	✓			
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			
C. QC Samples 1. Is the blank yield within acceptance criteria?			✓	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			
3. Does the blank result meet the Contract criteria?	✓			
4. Is the blank result < the Contract Detection Limit?	✓			
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			
7. Is the LCS yield within acceptance criteria?			✓	
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			
D. Other 1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			
3. Was the correct methodology used?	✓			
4. Was transcription checked?	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Were units checked?	✓			

Comments on any "No" response: _____

AIR QUALITY DOCUMENT

First Level Review: Pam Kenitzer Date: 2-29-00

Second Level Review: Jackie Waddell Date: 3/11/00

LS-038, Rev.5, 4/99

CHAIN OF CUSTODY

Q-27038

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-024-01	Page 1 of 1
Collector: Fahlberg	Company Contact: D Jacques	Telephone No.: 373-5299	Project Coordinator: TRENT, SJ	Price Code: 6G; Air Quality: ☑	Data Turnaround: 15 Days
Project Designation: 105-KE RadCon Air Filter Analysis	Sampling Location: 105 KE		SAF No.: B00-024	
Ice Chest No.: ERC-97-079	Field Logbook No.: EL 1424	COA: B105KE2W23	Method of Shipment: Government Vehicle	
Shipped To: Quanterra Incorporated	Offsite Property No.		Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SDL

W03077

SAMPLE ANALYSIS

Due 2-29

JOB140160

	Preservation	Type of Container	No. of Container(s)	Volume	See item (1) in Special Instructions
	None	Zip Loc Bag	1	1g	

Sample No.	Matrix *	Sample Date	Sample Time	
B0XKV2 08JF4	Other Solid	2-14-00	1130	X

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
RC Fahlberg	2-14-00 / 1130	R. Fahlberg / R. Fahlberg	2-14-00 1130
R. Fahlberg / R. Fahlberg	2-14-00 1355	K. Achterberg / K. Achterberg	2/14/00 1355
			2100 CPM

SPECIAL INSTRUCTIONS

** Laboratory is to composite all air filter material and analyze as one sample.

(1) Gross Alpha; Gross Beta. Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Activity Scan

14 individuale air filters in seperate envelopes to be composited by lab for one sampe analysis.

AIR QUALITY DOCUMENT

Matrix *: S=Soil; Sd=Sediment; SO=Solid; Sl=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

ERC Radiological Counting Facility Analysis Report

RCF Number RCF6504 **Sample Date & Time** N/A

Project ID: ISFM RadCon **SAF Number:** None **Date Analyzed** 9-16-99

Sample ID: AIR-IFSM-99-0620

Gamma Energy Analysis

Nuclide	Activity (uCi/cc)	Error (uCi/cc)	MDC (uCi/cc)

Analysis not requested

AIR QUALITY DOCUMENT

N/A
Total GEA (uCi/cc)

	Activity (uCi/cc)		Error (uCi/cc)	Alpha MDC (uCi/cc)
Gross Alpha**	3.1E-14	+/-	4.2E-14	2.5E-14
Gross Beta	9.4E-14	+/-	5.5E-14	**Beta MDC (uCi/cc)** 8.2E-14

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDC = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDC GEA values in the second significant digit.

COPY

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

L. IDAC
9-22-99

Analyst T. J. Snider 9/21/99 **Report To** **Fax**

Report Printed: Tuesday, September 21, 1999

ERC Radiological Counting Facility Analysis Report

RCF Number RCF6508

Sample Date & Time 9/15/99 1320

Project ID: ISFM RadCon **SAF Number:** NONE **Date Analyzed** N/A

Sample ID: AIR-IFSM-99-0624

Gamma Energy Analysis

Nuclide	Activity (uCi/cc)	Error (uCi/cc)	MDC (uCi/cc)

Analysis not requested

N/A
Total GEA (uCi/cc)

	Activity (uCi/cc)		Error (uCi/cc)
Gross Alpha**	6.5E-14	+/-	8.1E-14
Gross Beta	6.7E-13	+/-	2.2E-13

Alpha MDC (uCi/cc) 4.3E-14

Beta MDC (uCi/cc) 3.9E-13

AIR QUALITY DOCUMENT

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDC = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDC GEA values in the second significant digit.

COPY

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

L. 1 DAC 9-22-99

Analyst T. J. Snider 9/21/99 **Report To** **Fax**

Report Printed: Tuesday, September 21, 1999

0020

ERC Radiological Counting Facility Analysis Report

RCF Number RCF6505 Sample Date & Time N/A

Project ID: ISFM RadCon SAF Number: NONE Date Analyzed 9-16-99

Sample ID: AIR-IFSM-99-0601

Gamma Energy Analysis

Nuclide	Activity (uCi/cc)	Error (uCi/cc)	MDC (uCi/cc)

Analysis not requested

N/A
Total GEA (uCi/cc)

		Activity (uCi/cc)		Error (uCi/cc)
Gross Alpha**	<	2.2E-14		
Gross Beta		1.1E-13	+/-	7.7E-14

Alpha MDC (uCi/cc)
2.2E-14
Beta MDC (uCi/cc)
9.9E-14

AIR QUALITY DOCUMENT

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDC = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDC GEA values in the second significant digit.

COPY

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

L. IDAC

Analyst T. J. Snider 9/21/99 Report To Fax 9-2299

Report Printed: Tuesday, September 21, 1999

0021

ERC Radiological Counting Facility
Air Sample Activity Report - Gross Alpha/Beta

RCF # 6471

Sample Run ID: LB51 Unknown Pu-Sr (15min) - 19990915080 **Project/Cust. ID** AIR-IFSM-99-0523

Machine LB5100W **Report Date:** Wednesday, September 15, 1999 **SAF #** NONE

Sample ID	Carrier	Sample Type	Sample Volume	Acquistion Date/Time
19990915081847-A1	13	2-in Air Filter	6226 liters	9/15/99 8:18:57 AM

Net Alpha cpm	Alpha dpm	Alpha dpm 2 sigma	Alpha Bkgd cpm	Net Beta cpm	Beta dpm	Beta dpm 2 sigma	Beta Bkgd cpm
0.197	0.603	0.844	0.069	3.108	6.811	2.421	1.156

Alpha MDA (dpm)	Beta MDA (dpm)
0.423	3.987

Beta Efficiency: 45.56%

Alpha Efficiency: 32.59%

Alpha μ Ci/ml	Alpha uCi/ml 2 sigma	Beta μ Ci/ml	Beta uCi/ml 2 sigma	Alpha MDC (uCi/ml)	Beta MDC (uCi/ml)
4.4E-14	6.1E-14	4.9E-13	1.8E-13	3.1E-14	2.9E-13

AIR QUALITY DOCUMENT

COPY

L. 1 DAC 9-15-99 9-15-99

Analyzed By: [signature] **Date:** 9/15/99

Reviewed By: [signature] **Date:** 9/15/99

0022

ERC Radiological Co ıting Facility
Air Sample Activity Report - Gross Alpha/Beta

RCF # 6460

Sample Run ID: LB51 Unknown Pu-Sr (15min) - 19990910072 **Project/Cust. ID** ISFM RadCon AIR-IFSM-99-0575

Machine LB5100W **Report Date:** Friday, September 10, 1999 SAF # NONE

Sample ID	Carrier	Sample Type	Sample Volume	Acquistion Date/Time
19990910072733-A1	1	2-in Air Filter	18395 liters	9/10/99 7:27:53 AM

Net Alpha cpm	Alpha dpm	Aplha dpm 2 sigma	Alpha Bkgd cpm	Net Beta cpm	Beta dpm	Beta dpm 2 sigma	Beta Bkgd cpm
0.733	2.247	1.432	0.067	5.170	11.309	2.977	1.350

Alpha MDA (dpm)	Beta MDA (dpm)
1.117	6.257

Beta Efficiency: 45.56%

Alpha Efficiency: 32.59%

Alpha μ Ci/ml	Aplha uCi/ml 2 sigma	Beta μ Ci/ml	Beta uCi/ml 2 sigma	Alpha MDC (uCi/ml)	Beta MDC (uCi/ml)
5.5E-14	3.5E-14	2.8E-13	7.3E-14	2.7E-14	1.5E-13

COPY

AIR QUALITY DOCUMENT

.055pc

Analyzed By: Jerry Duffey Date: 9/10/99

Reviewed By: Date: 9/10/99

0023

ERC Radiological Counting Facility
Air Sample Activity Report - Gross Alpha/Beta

RCF # 6472

Sample Run ID: LB51 Unknown Pu-Sr (15min) - 19990915080 **Project/Cust. ID** AIR-IFSM-99-0537

Machine LB5100W **Report Date:** Wednesday, September 15, 1999 **SAF #** NONE

Sample ID	Carrier	Sample Type	Sample Volume	Acquistion Date/Time
19990915083358-A1	14	2-in Air Filter	3962 liters	9/15/99 8:34:08 AM

Net Alpha cpm	Alpha dpm	Aplha dpm 2 sigma	Alpha Bkgd cpm	Net Beta cpm	Beta dpm	Beta dpm 2 sigma	Beta Bkgd cpm
0.264	0.808	0.938	0.069	3.040	6.658	2.403	1.156

Alpha MDA (dpm)	Beta MDA (dpm)
0.515	3.912

Beta Efficiency: 45.56%

Alpha Efficiency: 32.59%

Alpha μ Ci/ml	Aplha uCi/ml 2 sigma	Beta μ Ci/ml	Beta uCi/ml 2 sigma	Alpha MDC (uCi/ml)	Beta MDC (uCi/ml)
9.2E-14	1.1E-13	7.6E-13	2.7E-13	5.9E-14	4.4E-13

COPY

AIR QUALITY DOCUMENT

< 1 DAC
9-15-99

Analyzed By: _____ **Date:** 9/15/99

Reviewed By: T. Self **Date:** 9/15/99

0024

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 2-14-00 SG#: WO 3077

Work Order Number: JOB140160 SAF #: 800-024

Shipping Container ID: ERC97-079 Chain of Custody # 800-024-1

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature N/A
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - [✓] tape
   - [✓] custody seals
   - [ ] hazard labels
   - [ ] appropriate sample labels

9. Samples are:
   - [✓] in good condition
   - [ ] broken
   - [ ] leaking
   - [ ] have air bubbles

10. Where any anomalies identified in sample receipt? Yes [ ] No [✓]

11. Description of anomalies (include sample numbers): _____

AIR QUALITY DOCUMENT

Sample Custodian/Laboratory: K. Witherspoon Date: 2-14-00

Telephoned To: _____ On _____ By _____

0025

RQC053

Parent Batch:
Associated Batches:
:
:
:
:

Quanterra Incorporated
Information Sheet Rad Prep

****
* *
* QC BATCH: 0046189 *
* *
****

W03077

PRIORITY
15day

Run Date: 2/15/00
Time: 9:10:15

Page: 1

TA: Gamma by HPGR
AW: Gamma PrpRC5017
5I: CLIENT: HANFORD

Analytical Due Date: 2/29/00

Project Manager: JW2

Lot# / Work Order	Client	Analyt Due / Matrix	Client / Aliquot	Name / Geometry	Count Time	Mid/Ave Date/Time		Tracer ID / Spike ID	CRDL	Units	Screen Info - (Ci) Alpha	Beta	PM Bin
J0B140160-001		2/29/00	Bechtel	Hanford,									JW2
D8JF4-1-03	FILTER		.0000		.000	2/14/00	11:30		5.00E-02	pCi/g	**NYS	**NYS	
Comments: FILTER											306		
J0B140160-001 X		2/29/00	Bechtel	Hanford,									JW2
D8JF4-1-06	FILTER		.0000		.000	2/14/00	11:30		5.00E-02	pCi/g	**NYS	**NYS	
Comments: FILTER											306		
J0B150000-189 B		2/29/00	Bechtel	Hanford,									JW2
D8JRP-1-01	BIOLOGICAL					2/14/00	11:30		5.00E-02	pCi/g	**NA	**NA	
Comments:													
J0B150000-189 C		2/29/00	Bechtel	Hanford,									JW2
D8JRP-1-02	BIOLOGICAL					2/14/00	11:30			pCi/g	**NA	**NA	
Comments:													

Total Number of Samples In Batch: 00004

Batch Information: Dry Wt: ? Decay Correct: Y Blank Sub: None Call In:

Uncert: Both Sigma: 1.960 ODR: Target List + Other Detected

	BLANK CRDL	Tracer Yield	Type	QC Control Limits
Cobalt 60	5.00E-02		RPD	
Cesium 137	1.00E-01		RPD	
Europium 152	1.00E-01		RPD	
Europium 154	1.00E-01		RPD	
Europium 155	1.00E-01		RPD	

** NYS = Not Yet Screened
** NA = Not Applicable
** Other = Other than Gross Alpha or Gross Beta
++ Indicates that Batch Information has changed for this sample. Print worksheet for details.

COC Signature Page

W03077

Lot or Batch #: 00416189

	Initials/Date	Procedure #
Released By	JH 2/15/00	RC0009
Received	SK 2/15/00	RC5011/RC5017
Released By	SK 2/16/00	n/a
Received	CM 2/16/00	RICHR0007K2
Released By	ml 2/16/00	n/a
Received	PK 2-16-00	RICHR0007K2
Released By	PK 2-18-00	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		

RC-131, Rev.1, 6/99

AIR QUALITY DOCUMENT

RQC053

Parent Batch:
Associated Batches:
:
:
:
:

PRIORITY
15day

Quanterra Incorporated
Information Sheet Rad Prep

****
* *
* QC BATCH: 0046185 *
* *
****

W03077

PRIORITY
15day

Run Date: 2/15/00
Time: 9:08:46

Page: 1

S7: Gross Alpha by GPC using Am-241 curve
BA: Gross Alpha PrpRC5016/5014
5I: CLIENT: HANFORD

Analytical Due Date: 2/29/00

Project Manager: JW2

Lot# / Work Order	Client	Analyt Due / Matrix	Client / Aliquot	Name / Geometry	Count Time	Mid/Ave Date/Time	Tracer ID / Spike ID	CRDL	Units	Screen Info - (Ci) Alpha	Beta	PM Bin
J0B140160-001 D8JF4-1-01	FILTER	2/29/00	Bechtel Hanford, .0000		.000	2/14/00 11:30		10	pCi/g	**NYS 306	**NYS	JW2
Comments:	FILTER											
J0B140160-001 X D8JF4-1-04	FILTER	2/29/00	Bechtel Hanford, .0000		.000	2/14/00 11:30		10	pCi/g	**NYS 306	**NYS	JW2
Comments:	FILTER											
J0B150000-185 B D8JR9-1-01	BIOLOGICAL	2/29/00	Bechtel Hanford,			2/14/00 11:30		10	pCi/g	**NA	**NA	JW2
Comments:												
J0B150000-185 C D8JR9-1-02	BIOLOGICAL	2/29/00	Bechtel Hanford,			2/14/00 11:30			pCi/g	**NA	**NA	JW2
Comments:												

Total Number of Samples In Batch: 00004

Batch Information:

Dry Wt: ?
Decay Correct: Y
Blank Sub: None
Call In:
Uncert: Both
Sigma: 1.960
ODR: Target List + Other Detected

BLANK CRDL		Tracer Yield	Type	QC Control Limits
Gross Alpha	10		RPD	

** NYS = Not Yet Screened
** NA = Not Applicable
** Other = Other than Gross Alpha or Gross Beta
++ Indicates that Batch Information has changed for this sample. Print worksheet for details.

PRIORITY

AIR QUALITY DOCUMENT

8200

0028

COC Signature Page

W03077

Lot or Batch #: 00416185

	Initials/Date	Procedure #
Released By	JH 2-15-00	RW09
Received	Dec 2-15-00	RICHRC5016.2/5014
Released By	Dec 2-29-00	n/a
Received	CD 3/7/00	RICHRC0003R2
Released By	CD 3/8/00	n/a
Received	JM 3-8-00	Rmgrad v2.7.1
Released By	JM 3-8-00	n/a
Received	DJ 3-8-00	RICHRC0002
Released By	PK 3-9-00	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		

RC-131, Rev.1, 6/99

AIR QUALITY DOCUMENT

RQC053

Parent Batch:
Associated Batches:
:
:
:
:

PRIORITY
15day

Quanterra Incorporated
Information Sheet Rad Prep

****
* *
* QC BATCH: 0046188 *
* *
****

W03077

PRIORITY
15day

Run Date: 2/15/00
Time: 9:09:37

Page: 1

S8: Gross Beta by GPC using Sr/Y-90 curve
BD: Gross Beta PrpRC5016/5014
5I: CLIENT: HANFORD

Analytical Due Date: 2/29/00
Project Manager: JW2

Lot# / Work Order	Client	Analyt Due / Matrix	Client / Aliquot	Name / Geometry	Count Time	Mid/Ave Date/Time	Tracer ID / Spike ID	CRDL	Units	Screen Info - (Ci) Alpha	Beta	PM Bin
J0B140160-001		2/29/00	Bechtel Hanford,									JW2
D8JF4-1-02	FILTER		.0000		.000	2/14/00 11:30		15	pCi/g	**NYS	**NYS	
Comments:	FILTER									306		
J0B140160-001 X		2/29/00	Bechtel Hanford,									JW2
D8JF4-1-05	FILTER		.0000		.000	2/14/00 11:30		15	pCi/g	**NYS	**NYS	
Comments:	FILTER									306		
J0B150000-188 B		2/29/00	Bechtel Hanford,									JW2
D8JRK-1-01	BIOLOGICAL					2/14/00 11:30		15	pCi/g	**NA	**NA	
Comments:												
J0B150000-188 C		2/29/00	Bechtel Hanford,									JW2
D8JRK-1-02	BIOLOGICAL					2/14/00 11:30			pCi/g	**NA	**NA	
Comments:												

Total Number of Samples In Batch: 00004

Batch Information: Dry Wt: ? Decay Correct: Y Blank Sub: None Call In:

Uncert: Both Sigma: 1.960 ODR: Target List + Other Detected

BLANK CRDL		Tracer Yield	Type	QC Control Limits
Gross Beta	15		RPD	

** NYS = Not Yet Screened
** NA = Not Applicable
** Other = Other than Gross Alpha or Gross Beta
++ Indicates that Batch Information has changed for this sample. Print worksheet for details.

AIR QUALITY DOCUMENT

0030

COC Signature Page

W03077

Lot or Batch #: 00160188	Initials/Date	Procedure #
Released By	2-15-00	RCW09
Received	2-15-00	Richter 5016-2 / 5014
Released By	2-25-00	n/a
Received	2/25/00	Richmond 3k
Released By	2/28/00	n/a
Received	2-28-00	Radcal 2.4
Released By	2-28-00	n/a
Received	2-28-00	Rich Rmnd 2
Released By	2-29-00	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		

RC-131. Rev.1. 6/99

A.R QUALITY DOCUMENT